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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

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REPORT OF PINE-BEETLE SURVEYS ON THE WENATCHEE NATIONAL FOREST, WASHINGTON SEASON OF 1939

Forest Insect Laboratory
445 U. S. Court House
Portland, Oregon

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REPORT OF PINE-BEETLE SURVEYS ON THE WENATCHEE NATIONAL FOREST, WASHINGTON SEASON OF 1939

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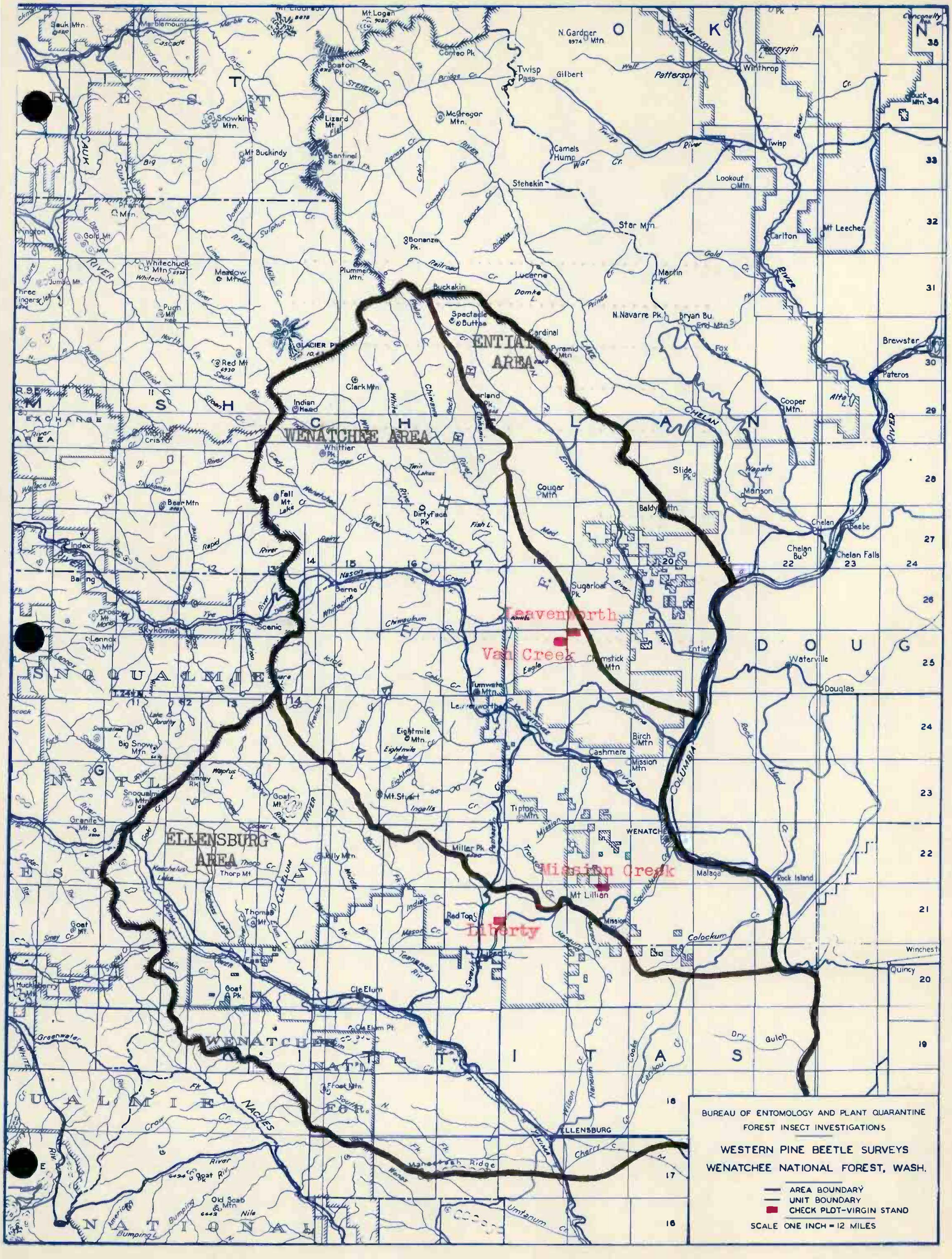
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS
WESTERN PINE BEETLE SURVEYS
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Introduction.

Since 1933, surveys to determine ponderosa pine mortality on the Wenatchee National Forest, Wash., have been cooperatively conducted by the Forest Service and the Bureau of Entomology and Plant Quarantine. The sixth survey was completed during the summer of 1939. These surveys are a part of a regional wide program, dealing with pine-beetle detection and control problems. The problems are: (1) To follow the behavior and the infestation trends of a group of tree-killing bark beetles (collectively called "pine beetles"), and primarily that of the western pine beetle (Dendroctonus brevicomis Lec.); (2) to locate and evaluate the areas of epidemic infestation warranting control work; and (3) to define the type of trees and the areas susceptible to pine-beetle attacks which demand consideration in timber management plans.

The 1939 program, as in the past two summers, was divided into two parts: (1) Intensive cruises were made on four permanent 320-acre check plots by a three-man crew composed of R. M. Ramstad (leader), S. O. Norman, and E. B. Wycoff, during the period of August 7-10, inclusive (a detailed description of these plots will be found in table 1); and (2) during the period August 9-11, the writer made another extensive or observational reconnaissance over most of the 544,000 acres of commercial pine stands within and adjacent to the Wenatchee National Forest. From these combined surveys, estimates of the total 1938 pine-beetle losses were prepared.

Past Losses.

A review of past surveys and past losses will be found in a previous report by the writer.[1/] Data on the check plots show that severe pine-beetle losses were sustained on the Wenatchee National Forest during the period 1931-33, inclusive. During this period, an average of 172 board feet per acre per year was recorded on the two original check plots. Since 1933, pine-beetle losses have been insignificant and have been approximately balanced by growth.

Recent Losses.

Nearly all of the recent, as well as past, ponderosa pine mortality on the Wenatchee National Forest has been the work of the western pine beetle (Dendroctonus brevicomis Lec.). Minor losses have resulted from attacks of the mountain pine beetle (D. monticolae Hopk.), flatheaded wood borers, or species of Ips beetles.

1/ Whiteside, J. M.—Report of pine-beetle surveys on the Wenatchee National Forest, Wash., 1931-1938.—December 1938.

A summary of the recent insect-caused pine depletion on four check plots is given in table 2. It will be noted that the 1938 losses on two plots were higher than those of 1937, while on the other two plots losses were lower. In general, the 1938 infestation is but slightly higher than that of the previous year, and the status of the western pine beetle is still characteristic of a marked normal endemic condition.

The current losses were recorded at a time when approximately 32 percent of the probable losses were evident. Estimated losses for 1939 are higher than those of 1938 on three plots and slightly lower on one plot, with the general plot trend continuing upward from the low of 1936. However, the pine-beetle situation on the Wenatchee National Forest at the present time remains in an endemic status, and no control measures are necessary.

As a result of the combined surveys during the past summer, estimates of the total 1938 ponderosa pine mortality on this forest have been prepared. These estimates, together with comparative 1937 data, are presented in table 3. To better illustrate the 1938 situation, map 2 has been included in the Appendix. This map shows the pine-beetle status at the end of 1938, as well as the general nature of the pine stands within and adjacent to the Wenatchee National Forest.

Significance of Pine-beetle Losses.

There are two facts concerning pine-beetle losses that should be of permanent importance to forest land-managing agencies. One is that these losses—chiefly those caused by the western pine beetle—are the second most important element in the depletion of Pacific Northwest pine forests. Stand reduction from this source ranks next to, and in certain years equals, that of saw-log production. The second fact is that the western pine beetle must be brought under control before plans for sustained production of ponderosa pine timber can become effective.

In some respects the ponderosa pine depletion situation on the Wenatchee National Forest is unique. The total effect of pine-beetle depredations in these stands has been greatly minimized by the depletion resulting from saw-log production. This latter drain receives its impetus from the demands of the great apple-growing industry—the Wenatchee and Yakima Valleys alone annually require in excess of one million feet of lumber. It is true that the average annual insect-caused depletion has been relatively unimportant during the period of our survey and loss records on these areas. However, from 1931-33 (and probably for a year or two prior to 1933), epidemic infestations resulted in the loss of considerable timber.

Recent insect surveys have failed to reveal any units of these stands which require immediate attention. Nevertheless, in present timber sales or in planning future sales, every consideration should be given to the persisting and depleting nature of pine-beetle activities. Recognition should be given to the desirability of removing insect-susceptible trees and priority should be given to any units or portions of the stand seeming to present a high hazard from insect attack.

Summary.

An account of forest-insect surveys on the Wenatchee National Forest during the summer of 1939, is presented, together with a brief review of past and recent losses.

Practically all of the insect-caused ponderosa pine depletion on this forest is attributable to the work of the western pine beetle (Dendroctonus brevicomis Lec.).

Except for the years 1931-33, inclusive, (and probably for a year or two prior to 1931) pine-beetle losses represented a very low endemic condition. The trend has been decidedly downward from a peak in 1931 to a low in 1936. Since 1937, the losses have increased slightly each year.

The indicated depletion for 1939 is slightly higher than that of 1938, but no control measures are necessary.

Table 1.—Description of the Check Plots on the Wenatchee National Forest, Washington.

Infestation Area	Check Plots: Name of Plot	Location: T.	R.	Sec.	Elevation (feet)	Type	Site Quality	Acres: Total	Pine	Ponderosa Pine Volume: As of Jan. 1, 1938 (mbm)	Per Acre (Bd.ft.)
									Timbered		
Wenatchee	Leavenworth	25N	19E	6N/2	2,500 to 5,000	20.5	IV+	320	320	2,996	9.4
	Van Creek	25N	18E	12N/2	2,500 to 4,000	20.5	IV	320	240	1,753	7.3
	Mission Creek	21N	19E	3N/2	3,000 to 3,500	20.5	IV	320	320	2,131	6.7
Ellensburg	Liberty	21N	17E	24N/2	3,000 to 3,600	20 (22)	III-	320	320	3,282	10.3

Table 2.—Summary of Recent Check Plot Cruising Data and Ponderosa Pine Losses, Wenatchee National Forest, Washington

Check Plots	1937 Losses						1938 Losses						1939 Losses (Tentative)		
	Trees		Volume				Trees		Volume						
	Total	Per Acre	Total	Per Acre	% Stand	Ratio '37 to '36	Total	Per Acre	Total	Per Acre	% Stand	Ratio '38 to '37	Trees	Volume	% Stand
Leavenworth	14	.044	6,440	20	.21	1.97	13	.041	5,980	19	.20	.93	21	15,000	.50
Van Creek	5	.021	3,830	16	.22	-	4	.017	2,600	11	.15	.68	12	5,200	.30
Mission Creek	9	.028	3,500	11	.16	-	13	.041	15,350	48	.72	4.40	23	11,800	.56
Liberty	7	.022	7,180	22	.22	-	20	.063	9,700	30	.30	1.35	19	7,200	.22
Total	35	.029	20,950	17	.21	-	50	.042	33,630	28	.33	1.61	75	39,200	.39

Table 3.—Estimated Recent Ponderosa Pine Mortality on the Wenatchee National Forest, Washington

Infestation Area	Year of Loss	Mature Ponderosa Pine: Acres	Mature Ponderosa Pine: Volume (Mbm)	Losses: Trees: Total	Losses: Trees: Per Acre	Losses: Volume: Total (Mbm)	Losses: Volume: Per Acre (Bd.ft.)	% Stand
Entiat	1937	114,000	470,000	4,200	.037	1,200	11	.26
	1938	114,000	465,000	4,400	.039	2,200	19	.47
Wenatchee	1937	230,000	956,000	6,000	.026	1,800	8	.20
	1938	230,000	950,000	6,300	.027	3,600	16	.37
Ellensburg	1937	200,000	1,103,000	4,600	.023	1,500	8	.14
	1938	200,000	1,100,000	7,800	.039	3,700	19	.34
Forest Totals	1937	544,000	2,529,000	14,800	.027	4,500	8	.18
	1938	544,000	2,515,000	18,500	.034	9,500	17	.38

1939 PINE BEETLE SURVEY OF PONDEROSA PINE IN OREGON AND WASHINGTON

ENTIAT, WENATCHEE, AND ELLENSBURG INFESTATION AREAS

WENATCHEE NATIONAL FOREST, WASHINGTON

LEGEND

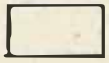
AREA BOUNDARIES

UNIT BOUNDARIES

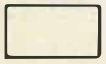
1938 BEETLE LOSS

0-25 trees per section. Normal infestation. Roughly about 0 to 1/4 of one percent of stand volume.

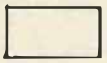
25-50 trees per section. Normal infestation. 1/4 to 1/2 of one percent of stand volume.



50-100 trees per section. Light epidemic infestation. 1/2 to 1 percent of stand volume.



100-200 trees per section. Moderate epidemic infestation, 1 to 2 percent of stand volume.



200-400 trees per section. Heavy epidemic infestation. 2 to 4 percent of stand volume.

Over 400 trees per section. Very heavy epidemic infestation. Over 4 percent of stand volume.

PONDEROSA PINE TYPES

Solid colors. Stands containing more than 50% ponderosa pine and of average or better thrift and vigor. In these stands the western pine beetle is the chief tree-killing agent.

Cross-hatched colors. Stands containing from 20-50% ponderosa pine.

Dotted colors. Ponderosa pine stands of marginal or fringe type. In many of these areas drought as well as insects is an important tree-killing factor.

Cut-over areas.

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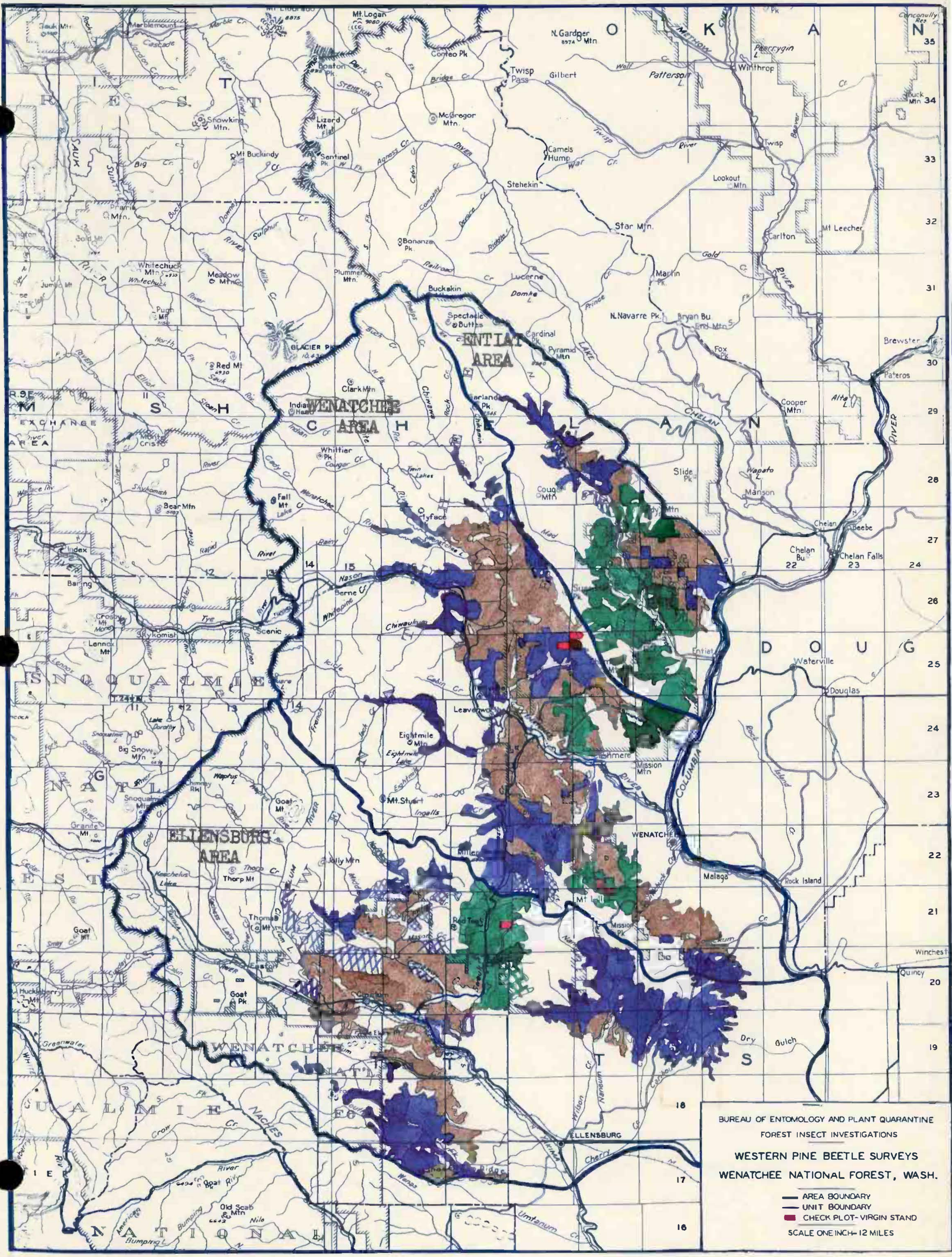
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